

1. A retractable top system for a vehicle having a body with a passenger
2 compartment defined therein, the body further having a storage area defined behind the
passenger compartment, the vehicle having a windshield defining the forward end of the
4 passenger compartment with a header at its upper edge, the header including an
engagement feature, the top system having an extended position wherein the top system
6 defines a roof over the passenger compartment and interconnects with the windshield
header, a storage position wherein the top system does not cover the passenger
8 compartment and at least a portion of the top system is disposed in the storage area, and
an intermediate position between the extended and storage positions, the top system
10 comprising:

a top having a forward end and a rearward end, the rearward end being detachably
12 and pivotally interconnected with the vehicle body adjacent the rear of the passenger
compartment, the top including a latching member at the forward end, the latching
14 member operable to selectively engage the engagement feature of the header so as to
interconnect the forward end of the top with the header; and

16 a cover selectively covering the storage area behind the passenger compartment,
the cover having a forward end and a rearward end, the cover having a closed position
18 wherein the cover closes the storage area and an open position wherein the forward end
moves upwardly so as to uncover at least a portion of the storage area, the cover having
20 an under side with an engagement feature and a retaining latch defined thereon, the
engagement feature being adjacent the forward end and the retaining latch being spaced
22 rearwardly therefrom;

wherein when the top system is in the extended position, the top extends over the
24 passenger compartment with the rearward end being interconnected with the vehicle body
and the latching member being engaged with the engagement feature of the header so that
26 the forward end is interconnected with the header, and when the top system is in the
intermediate position, the latching member engages the engagement member on the under
28 side of the cover and the rearward end of the top is retained adjacent the underside of the
cover by the retaining latch such that the top is supported by the cover and is movable

30 therewith, the top system being in the storage position when the top is retained adjacent
the underside of the cover and the cover is in the closed position.

2. The top system according to claim 1, wherein the top includes a top frame
2 and a flexible membrane covering the top frame when the top system is in the extended
position, the top frame including the latching member and the pivotal and detachable
4 interconnection with the vehicle body.

3. The top system according to claim 2, wherein the flexible membrane has a
2 rearward edge that is connected to an upper surface of the cover over the storage area
when the top system is in the extended position.

4. The top system according to claim 2, wherein the top frame has a central
2 portion with a forward end and a rearward end, the forward end being interconnected
with the windshield header when the top system is in the extended position, the top frame
4 further having a pair of C-pillar portions pivotally interconnected with the central portion,
the C-pillar portions extending between the central portion and the vehicle body when the
6 top system is in the extended position and the C-pillar portions folding against the central
portion when the top system is in the storage position.

5. The top system according to claim 1, further including a rear window
2 supported on the vehicle body at the rear of the passenger compartment, the rear window
being disposed generally vertically when the top system is in the extended position.

6. The top system according to claim 5, wherein the rear window remains
2 stationary when the top system moves from the extended position to the intermediate
position.

7. The top system according to claim 5, wherein the top includes a top frame
2 and a flexible membrane covering the top frame when the top system is in the extended
position, the top frame including the latching member and the pivotal and detachable
4 interconnection with the vehicle body.

8. The top system according to claim 7, wherein a portion of the flexible
2 membrane extends rearwardly of the rear window so as to define a rearwardly extending
fin portion on each side of the rear window when the top system is in the extended
4 position.

9. The top system according to claim 1, wherein the top has an inner surface
2 and an opposed outer surface, the inner surface facing the passenger compartment when
the top system is in the extended position and being directed generally downwardly when
4 the top system is in the storage position.

10. The top system according to claim 1, wherein the top has a central portion
2 with a forward end and a rearward end, the forward end being interconnected with the
windshield header when the top system is in the extended position, the top further having
4 a pair of C-pillar portions pivotally interconnected with the central portion, the C-pillar
portions extending between the central portion and the vehicle body when the top system
6 is in the extended position and the C-pillar portions folding against the central portion
when the top system is in the storage position.

11. A retractable top system for a vehicle having a body with a passenger
2 compartment defined therein, the body further having a storage area defined behind the
passenger compartment, the vehicle having a windshield defining the forward end of the
4 passenger compartment with a header at its upper edge, the top system having an
extended position wherein the top system defines a roof over the passenger compartment
6 and interconnects with the windshield header, a storage position wherein the top system

does not cover the passenger compartment and at least a portion of the top system is
8 disposed in the storage area, and an intermediate position between the extended and
storage positions, the top system comprising:

10 a top having a central portion with a forward end and a rearward end; the forward
end being interconnected with the windshield header when the top system is in the
12 extended position, the top further having a pair of C-pillar portions pivotally
interconnected with the central portion, the C-pillar portions extending between the
14 central portion and the vehicle body when the top system is in the extended position and
the C-pillar portions folding against the central portion when the top system is in the
16 storage position.

12. The top system according to claim 11, wherein the top includes a top
2 frame and a flexible membrane covering the top frame when the top system is in the
extended position, the top frame including the latching member and the pivotal and
4 detachable interconnection with the vehicle body.

13. The top system according to claim 12, wherein the central portion and the
2 C-pillar portions each have an outer surface with the outer surfaces cooperating to define
the outer surface of the top frame, the central portion and the C-pillar portions each
4 interconnecting at a hinge region with the pivotal interconnection being a hinge having a
hinge axis that is offset inwardly from the outer surface of the central portion and the C-
6 pillar portion, the flexible membrane covering the outer surfaces of the central portion
and the C-pillar portions and having a pair of pocket portions each extending into one of
8 the hinge regions, the pocket portions being configured such that when the C-pillar
portions extend between the central portion and the body the pocket portions are disposed
10 in the hinge region inboard of the outer surfaces and when the C-pillar portions are folded
against the central region the pocket portions continuously cover the hinge region.

14. The top system according to claim 11, further including a rear window
2 supported on the vehicle body at the rear of the passenger compartment, the rear window
being disposed generally vertically when the top system is in the extended position.

15. The top system according to claim 14, wherein the rear window remains
2 stationary when the top system moves from the extended position to the intermediate
position.

16. The top system according to claim 11, wherein the top has an inner surface
2 and an opposed outer surface, the inner surface facing the passenger compartment when
the top system is in the extended position and being directed generally downwardly when
4 the top system is in the storage position.

17. A method of moving a top system for a vehicle from an extended position
2 wherein the top system defines a roof over a passenger compartment of the vehicle to a
storage position wherein the top system does not cover the passenger compartment, the
4 method comprising the steps of:

providing a top having a forward end and a rearward end, the rearward end being
6 detachably and pivotally interconnected with the vehicle body adjacent the rear of the
passenger compartment, the forward end being detachably interconnected with a
8 windshield header at the forward end of the passenger compartment;

providing a cover for selectively covering a storage area to the rear of the
10 passenger compartment in the vehicle, the cover having a forward end and a rearward
end, the cover having a closed position wherein the cover closes the storage area and an
12 open position wherein the forward end moves upwardly so as to uncover at least a portion
of the storage area;

14 moving the cover from the closed position to the open position;
detaching the forward end of the top from the windshield header;

- 16 pivoting the top such that the forward end moves upwardly and rearwardly from
the windshield header;
- 18 pivotally interconnecting the forward end of the top with the underside of the
cover adjacent the forward end of the cover;
- 20 detaching the rearward end of the top from the vehicle body;
rotating the top about the forward end such that the rearward end of the top moves
- 22 rearward until the top is adjacent the underside of the cover;
retaining the top adjacent the underside of the cover;
- 24 moving the cover to the closed position such that the top is disposed in the storage
area.

18. The method according to claim 17, wherein the top has a central portion

2 with a forward end and a rearward end, the forward end being interconnected with the
windshield header when the top system is in the extended position, the top further having

4 a pair of C-pillar portions pivotally interconnected with the central portion, the C-pillar
portions extending between the central portion and the vehicle body when the top system

6 is in the extended position, the method further comprising the step of folding the C-pillar
portions against the central portion prior to moving the cover to the closed position.

19. The method according to claim 17, wherein the cover has a first open

2 position and a second open position with the forward end of the cover being farther
upward when cover is in the second open position than when the cover is in the first open

4 position, the step of moving the cover from the closed position to the open position
comprising moving the cover to the first open position, the method further comprising the

6 step of moving the cover from the first open position to the second open position after the
forward end of the top is pivotally interconnected with the underside of the cover, such

8 that the top is lifted upwardly to perform the detaching step.

20. A retractable top system for a vehicle having a passenger compartment
2 and a storage area behind the passenger compartment, the vehicle having a body and a
windshield defining the forward end of the passenger compartment, the windshield
4 having a header, the top system having an extended position wherein the top system
defines a roof over the passenger compartment and interconnects with the windshield
6 header and a storage position wherein the top system does not cover the passenger
compartment and at least a portion of the top system is disposed in the storage area, the
8 top system comprising:

a rear window having an upper edge and a pair of side edges, the rear window
10 having a first position wherein the window is supported on the body at the rear of the
passenger compartment in a generally vertical position, the rear window being in the first
12 position when the top system is in the extended position;

a support frame having a forward end and a rearward end, the forward end of the
14 support frame interconnecting with the windshield header when the top system is in the
extended position, the rearward end being pivotally interconnected with the vehicle body
16 at the rear of the passenger compartment, the support frame having an inner surface and
an opposed outer surface, the inner surface facing the passenger compartment when the
18 top system is in the extended position; and

a cover having a forward end and a rearward end, the cover having a closed
20 position wherein the cover closes the storage area and an open position wherein the
forward end moves upwardly so as to uncover at least a portion of the storage area, the
22 cover having an inner surface and an opposed outer surface, the inner surface facing the
storage area when the cover is in the closed position;

24 a flexible roof membrane having a forward edge proximate the forward end of the
support frame, the roof membrane extending rearwardly so as to cover at least the outer
26 surface of the support frame when the top system is in the extended position, the roof
membrane further having a pair of rear fin portions, each fin portion extending
28 rearwardly of the rear window adjacent one of the side edges of the rear window when
the top system is in the extended position, the fin portions having rearmost edges that are

30 adjacent the outer surface of the cover when the top system is in the extended position
and the cover is closed.

21. The top system according to claim 20, wherein the support frame is a one
2 piece frame that extends between the forward end and the rearward end and does not fold
or collapse, the outer surface of the support frame being directed downwardly when the
4 top system is in the storage position.

22. The top system according to claim 20, wherein the support frame is a two
2 piece frame having a rearward piece and a forward piece that are pivotally
interconnected, the forward piece interconnecting with the windshield header when the
4 top system is in the extended position and the rearward piece being pivotally
interconnected with the vehicle body, the rearward and forward pieces each having an
6 inner surface and an outer surface, with the inner surfaces facing the passenger
compartment when the top system is in the extended position, the outer surface of the
8 rearward piece being directed downwardly when the top system is in the storage position.

23. The top system according to claim 22, wherein the two piece frame folds
2 when the top system is in the storage position such that the inner surface of the rearward
piece faces the inner surface of the forward piece.

24. The top system according to claim 22, wherein the two piece frame folds
2 when the top system is in the storage position such that the outer surface of the rearward
piece faces the outer surface of the forward piece.

25. The top system according to claim 20, further comprising a rear window
2 frame interlinked with the support frame.

26. The top system according to claim 25, further comprising a pair of fin
2 supports, each fin support supporting one of the fin portions of the flexible membrane
and being pivotally interconnected with the window frame.

27. A retractable top system for a vehicle having a body with a passenger
2 compartment defined therein, the body further having a storage area defined behind the
passenger compartment, the vehicle having a windshield defining the forward end of the
4 passenger compartment with a header at its upper edge, the top system having an
extended position wherein the top system defines a roof over the passenger compartment
6 and interconnects with the windshield header and a storage position wherein the top
system does not cover the passenger compartment and at least a portion of the top system
8 is disposed in the storage area, the top system comprising:

a support frame assembly having a forward end and a rearward end, the forward
10 end being interconnected with the windshield header when the top system is in the
extended position;

12 a pair of fin supports each having a first end pivotally interconnected with the
rearward end of the support frame assembly and a second end extending therefrom, each
14 fin support being movable between an extended position wherein the fin support extends
rearwardly from the support frame and a folded position wherein the fin support is
16 pivoted toward the support frame assembly;

a cover having a forward edge and a rearward edge, the cover having a closed
18 position wherein the cover closes the storage area and an open position wherein the
forward edge moves upwardly so as to uncover at least a portion of the storage area, the
20 cover having an inner surface and an opposed outer surface, the inner surface facing the
storage area when the cover is in the closed position, the cover having a pair of
22 engagement features defined thereon;

wherein when the forward end of the support frame assembly is interconnected
24 with the windshield header and the cover moves from the open position to the closed
position, the engagement features on the cover engage the fin supports and move the fin

26 supports from the folded position to the extended position, the fin supports being adjacent
the outer surface of the cover when the cover is closed and the fin supports are in the
28 extended position.

28. The top system according to claim 27, wherein the fin supports are spring
2 biased to the folded position.

29. The top system according to claim 27, wherein the fin supports each
2 include a fin engagement arm extending therefrom, the engagement features on the cover
engaging the engagement arms.

30. The top system according to claim 27, further comprising a rear window
2 having an upper edge and a pair of side edges, the rear window having a first position
wherein the window is supported on the body at the rear of the passenger compartment in
4 a generally vertical position, the rear window being in the first position when the top
system is in the extended position.

31. The top system according to claim 30, wherein the support frame
2 assembly includes a rear window frame, the fin supports being pivotally interconnected
with the rear window frame.

32. The top system according to claim 30, further comprising a flexible roof
2 membrane having a forward edge proximate the forward end of the support frame
assembly, the roof membrane extending rearwardly so as to cover at least the support
4 frame assembly when the top system is in the extended position, the roof membrane
further having a pair of rear fin portions, each fin portion extending rearwardly of the rear
6 window adjacent the side edges of the rear window when the top system is in the
extended position, the fin portions each having rearmost edges that are interconnected

KMN-10702/16
33009jal

- 8 with the second end of one of the fin frames and are adjacent the outer surface of the cover when the top system is in the extended position and the cover is closed.